AIR FORCE DOCTRINE PROBLEMS

1926-Present

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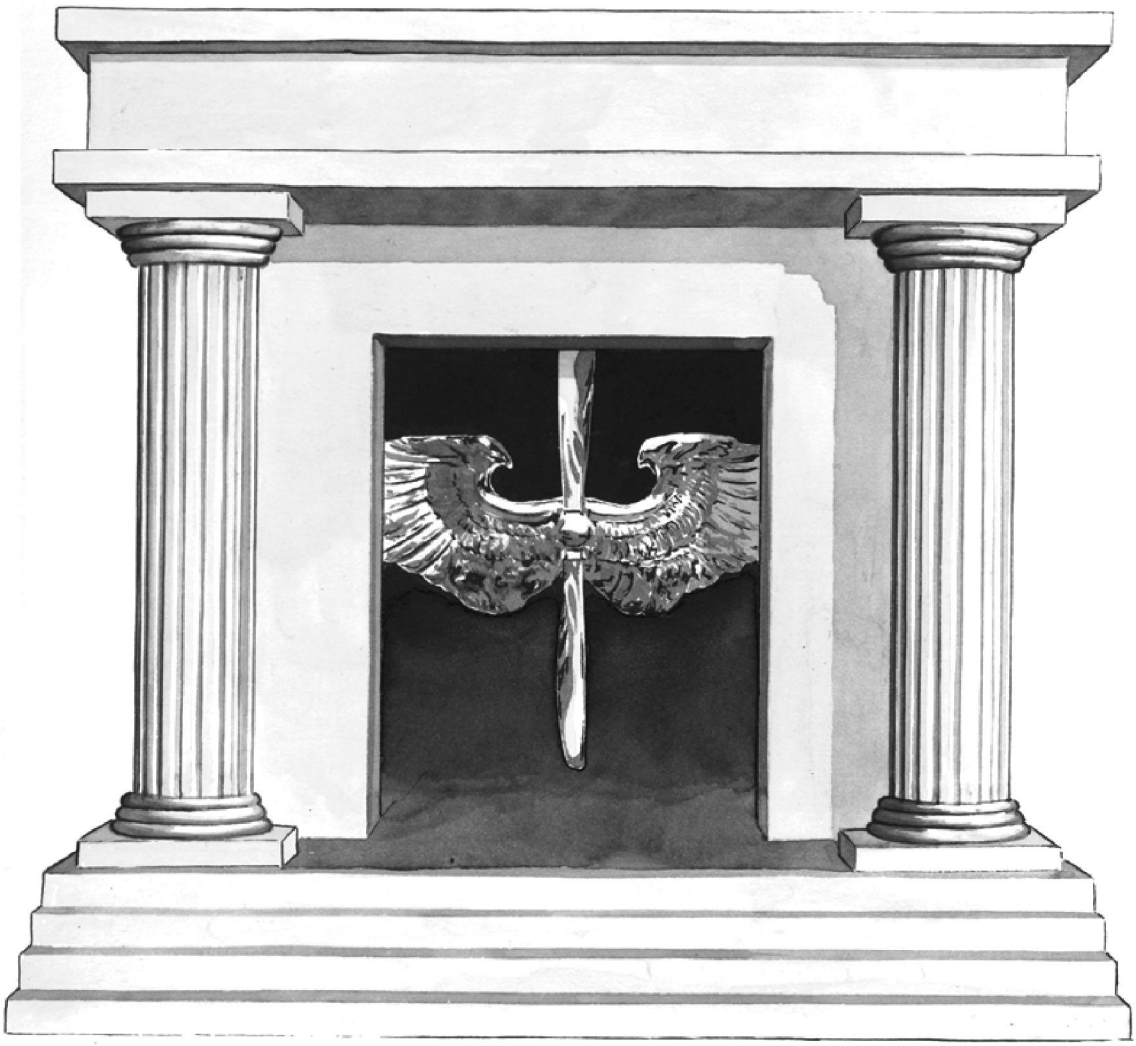

At the heart of warfare lies doctrine. It represents the central beliefs for waging war in order to achieve victory. Doctrine is of the mind, a network of faith and knowledge reinforced by experience which lays the pattern for the utilization of men, equipment, and tactics. It is the building material for strategy. It is fundamental to sound judgment.

—Gen Curtis Emerson LeMay, 1968

THE DOCTRINAL HISTORY of the United States Air Force has been short and troubled. The Air Force[1] first tried to write doctrine in the aftermath of World War I, while still an organic part of the United States Army. It confronted numerous problems then, just as it has ever since that time. Some of those problems run like consistent threads through Air Force history, and they are the focus of this article. Until the Air Force acknowledges, accepts, and understands these persisting problems, it will not be able to resolve them. Until it does resolve them, it will continue to have trouble with its doctrine and its place in the order of battle. The consequences of these problems for its relations with the other services, its role on the battlefield, and its continued viability as a fighting force, will be highly significant. This is especially true in a time of serious fiscal constraint.

Four problems stand out. The first is a corollary to the argument that Carl Builder advances in his new book, *The Icarus Syndrome*. Builder argues that the Air Force has neglected airpower theory as the basis for its mission or purpose.[2] This neglect of airpower theory, from which doctrine should flow,[3] has also impaired the ability of the Air Force to write sound doctrine, particularly operational doctrine. The second problem is the Air Force's need for an established and institutionalized process for the development and transmission of basic and operational-level doctrine. The third problem is its fear of finding itself committed doctrinally to more than it can in fact deliver. As a result of this concern, the Air Force has been unwilling to articulate precisely what it can do for each of the other services. The fourth problem is that of its own long-term paranoia, a difficulty that has been to a great extent an influence on the Air Force abandoning its reliance upon airpower theory as its underlying creed. Specifically, it has become obsessed with winning the budget battles for hardware without the underpinning of airpower theory. As a result, it has lost a bigger and bigger piece of that very action which the service itself has come to believe is essential to its survival, the budgetary battles.[4] These arguments must be examined more closely to establish them as past problems, as well as existing problems yet to be addressed.

Terminology

The arguments raised here only deal with *basic* and *operational* doctrine. These terms came into general use during the period under discussion. Doctrine that belongs to each of these categories was developed before the definition that best describes it came into general use. First, it is necessary to establish exactly what is meant by these terms, and to show that doctrine developed prior to the establishment of these definitions does in fact conform to them.

According to the leading Air Force doctrine historian, Frank Futrell, the term *basic doctrine* appeared in 1940, when it was applied by the Army Air Forces (AAF) to Field Manual (FM) 1-5, *Employment of the Aviation of the Army*.[5] Basic doctrine

> establishes fundamental principles that describe and guide the proper use of aerospace forces in war. Basic doctrine, the foundation of all aerospace doctrine, provides broad, enduring guidance which should be used when deciding how Air Force forces should be organized, trained, equipped, employed, and sustained. Basic doctrine is the cornerstone and provides the framework from which the Air Force develops operational and tactical doctrine.[6]

Operational doctrine as a term appears later than basic doctrine. In the 1930s, when airmen began to try to write air doctrine, they had no definition of the term *operational* in the modern sense of that expression. One of the earliest uses of the term was postwar and meant that "the activity is in operation," in the sense of ongoing.[7] Operational doctrine was first conceived at Air University about 1947,[8] as one of three categories of air doctrine.[9] In the modern sense, operational doctrine establishes principles that guide the use of aerospace forces in campaigns and major operations. It examines relationships among objectives, forces, environments, and actions to ensure that aerospace operations contribute to achieving assigned objectives.[10]

These, then, are the definitions we will use in considering the doctrinal problems of the Air Force.

Early Efforts to Develop Doctrine, 1926-41

The Air Corps issued its first doctrine publication in 1926, after spending almost eight years working on the problem of describing what aviation could be expected to do in war.[11] The War Department, understandably dominated by ground combat arms officers, oversaw the preparation of this publication, which appeared as Training Regulation (TR) 440-15, *Fundamental Principles for the Employment of the Air Service*, on 26 January 1926.[12] In the view of Alfred Hurley, one interpreter of the main thrust of this doctrine: " 'The fundamental doctrine' permitted the airmen was 'to aid the ground forces to gain decisive success,' with some recognition of the need for special missions at a great distance from the ground forces."[13] Revised in 1935, this was the doctrine of Army Aviation from 1926 to 1940.

Those airmen who believed in the potential of airpower as a decisive weapon were viewed as radicals by the balance of the Army.

The Air Corps Tactical School (ACTS), [14] located at Langley Field, Virginia, until the summer of 1931 and from July of that year at Maxwell Field, Alabama, began to assess what air forces might do to help avoid a repetition of the stalemate and bloodbath of trench warfare. The faculty focused on ideas about winning a war quickly, with the smallest possible cost to the nation in terms of blood and treasure. The drive to achieve the goal of a separate, or independent, air force within the American military structure was an important influence, if not the predominant influence. [15]

Post-World War I airpower theory was being developed premised upon the ideas of airpower's very first theorists, notably William ("Billy") Mitchell and Gen Hugh Trenchard. Arguments still rage over whether or not Giulio Douhet had any influence at ACTS through translated versions of his impressive *The Command of the Air,* [16] published in 1922 and revised in 1930.[17] Most of the men there at the time have said postwar that they knew little or nothing about his work.[18] But there is no doubt that Mitchell and Douhet shared ideas in the early twenties, [19] and most of the men at ACTS were disciples of Mitchell. [20] Hence the communication of ideas may have occurred and been no more than a result of intellectual conversations. [21]

Those airmen who believed in the potential of airpower as a decisive weapon were viewed as radicals by the balance of the Army. [22] Moreover, these visionary airmen who foresaw the need for an independent air force if airpower was ever to be exercised with real effectiveness, became progressively more independent of the balance of the Army in their thinking. A logical outgrowth of this, coupled to the Mitchell controversy and court-martial of 1925, was the creation of a cadre of Mitchell supporters and adherents who came to dominate Air Corps thinking, organization, and development.[23] Over the passage of time, these men, like Mitchell, became ever more committed to a separate air force independent of what they viewed as the stifling effects of Army control of aviation. Thus, they became, by Army standards, true "heretics," even compared to other Air Corps officers of a more conservative bent.[24]

The main issue for airmen who believed in the ultimate efficacy of airpower as a war winner was how to produce such an outcome. Work by the dedicated visionaries at the Air Corps Tactical School, the Air Corps's "think tank" in the late twenties and early thirties, focused on a solution to war winning that was a product of the British experience of World War I and the views of Mitchell, Trenchard, and possibly Douhet—strategic bombing of the enemy war-making capacity.[25] The work at ACTS from the late twenties onward focused on air forces in national strategy and by the mid-thirties was a major part of the curriculum. [26]

The concomitant desire for a separate air force led to a long, drawn-out, often bitter struggle between airmen and nonairmen. The airmen often became embittered, and that struggle produced a paranoid state of mind in airmen that has been transmitted from one generation of airmen to the next.[27] It is this paranoia that has been largely responsible for keeping modern airmen focused on "survival of the service" rather than on airpower theories, operational doctrine, and cooperation in a joint world with the other services. It persists to this day. It is the single overriding intellectual feature of Air Force thinking.

The airpower theories considered in detail at ACTS in the late twenties and early thirties led directly to the first true airpower doctrine ever developed in this country. The airmen at ACTS individually worked on ideas that, when brought together, produced a body of operational doctrine. This process is reflective of the "ad hoc" manner in which the Air Force has continued to write its basic and operational doctrine ever since.

In May 1929, Maj Walter H. Frank, the assistant commandant of ACTS, attended the Ohio air maneuvers and came away convinced that the "bomber would always get through" whatever air defenses were mounted against it.[28] This seemed to confirm the British experience with the German Zeppelins and Gothas of 1915-18.[29] He returned to ACTS, then at Langley Field, and discussed his observations with the faculty. Among these was 1st Lt Kenneth N. Walker, who picked up on the idea and soon reduced it to an article of faith.[30]

That same year, a young mathematically inclined captain named Donald Wilson joined the faculty to begin a decade-long affiliation with ACTS. [31] He brought his mathematical mind to bear upon the problem of hitting a target with a bomb, and as he worked over the next couple of years, he developed the concept of "circular error of probability," the now familiar CEP.[32] By about 1931, testing with the aircraft and facilities available to the ACTS faculty, [33] CEP was reduced to a calculable proposition, even with the bombsights then available. From this could be calculated the number of bombs that had to be dropped to theoretically destroy a target. [34] At the same time, industry was pressing on with technological exploration of new equipment and ideas while looking for markets. [35]

In 1932, as Walker and Wilson, among others, were developing and testing their ideas, the man who would

synthesize all of this into the first real air doctrine arrived at Maxwell Field to join the ACTS faculty. Capt Harold ("Hal") L. George arrived to head up the Bombardment Section of the ACTS faculty, a job he held until he was promoted to head the Department of Air Tactics and Strategy in 1934. George consolidated the thinking of the school into an essentially unwritten operational doctrine articulating strategic attack as a war-winning weapon.[36] Specifically,

> the principal and all important mission of air power, *when its equipment permits*, is the attack of those vital objectives in a nation's economic structure which will tend to paralyze the nation's ability to wage war and thus contribute directly to the attainment of the ultimate objective of war, namely, the disintegration of the hostile will to resist. (Emphasis added)[37]

The operational heart of this doctrine, developed at the Air Corps Tactical School took the form of precision, high-altitude, daylight, strategic bombardment.[38] Mass bombing of cities was simply not then acceptable, and the tone and temper of the nation and its military reflection thus necessitated eschewing Douhet's solution in favor of an argument for precision, even if that was not yet really possible.[39] By 1934-35 ACTS faculty turned their attention to the target sets against which this doctrine should be directed.[40] This led to the industrial web concept, upon which the 1941 procurement plan, Air War Plans Division-1 (AWPD-1), "Munitions Requirements of the Army Air Force," would be based.[41]

The Navy had commissioned a new bombsight in 1921. In 1927 Carl Norden delivered such a superior bombsight that it became a highly classified secret, which the Navy delayed sharing with the Air Corps.[42] This was a tachometric, electro-optical bombsight of extraordinary accuracy once it was fully developed, including an autopilot allowing the aircraft to be slaved to the sight. It was 1933 before the Air Corps ordered its first few Norden sights through the Navy. It was May 1935 before they began to distribute Nordens to a couple of operational units on a purely experimental basis. The sight remained highly classified. Even the ACTS faculty did not know of it in 1938![43]

The B-17 is the other piece of the strategic bombardment story. In 1939 the 49th Bombardment Squadron was the only one in the Air Corps equipped with B-17C aircraft. In the budget for 1940 there was originally no B-17 procurement money at all![44] By the time that B-17s began to enter the inventory in 1940-41, the ACTS faculty had long been urging crews to view all targets as precision targets because of the political unacceptability of area bombing, already mentioned, and the philosophy of the "heretics."[45]

It is important to recognize that basic and operational doctrine properly determine for the service what technology and equipment it should select, as occurred in this case.[46] Gen Henry H. ("Hap") Arnold said at the end of the war that

> any Air Force which does not keep its doctrines ahead of its equipment, and its vision far into the future, can only delude the nation into a false sense of security."[47]

The other way around is what Builder points out has gotten the Air Force in so much difficulty in recent years: Letting "technology" drive everything else.[48]

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With the acquisition of the Norden-equipped B-17 in the offing in 1940, and with the doctrine of high-altitude, daylight, precision attack upon an industrial web seven years in the ACTS curriculum, the Air Corps had its first operational doctrine and a prototype force structure based on appropriate equipment. The fact that ACTS had been teaching this concept and doctrine for so long explains, in large measure, why the doctrine was so widely understood and accepted throughout the Air Corps by the time we entered the war. This feature of the doctrinal process, its effective transmission throughout the officer corps by education, is not well understood today. Merely reading the doctrine and hearing lectures on the subject is not nearly enough. At ACTS the students worked many problems revolving around the doctrine and its implementation, and through tough, frequent, hands-on efforts they learned the ideas very thoroughly .[49]

This doctrine, although described by Gen Haywood S. Hansell in his book as "basic" doctrine,[50] meets the test of being operational doctrine. It established the concept of a *sustained strategic bombardment campaign,* and the relationship between the objectives, forces, and environments. The objective was the *destruction of the enemy's war-making capacity and national will*. The forces required were *heavy bombers equipped with a superior bombsight* . The environments in which these forces would operate were *high altitude over the enemy urbanized industrial heartland* . Lastly, the doctrine spelled out the requisite actions— *precision attacks upon selected targets in the industrial web* .

With the acquisition of the Norden-equipped B-17 and the doctrine of high-altitude, daylight, precision attack on an enemy's industrial web taught in the Air Corps Tactical School curriculum for seven years, the Air Corps had its first operational doctrine and a prototype force structure based on appropriate equipment.

When the Air Corps published its first doctrine manual, FM 1-5, *Employment of the Aviation of the Army*, dated 15 April 1940, written under the guidance of Lt Col Carl Spaatz, one of the heretics, it was intended to be Air Corps basic doctrine. [51] This manual replaced interwar training regulations that had sufficed for doctrine publications from 1926 to 1940. [52] Regrettably, FM 1-5 was nothing more than an expanded version of the 1935 iteration of TR 440-15, and the Air Corps's unwritten doctrine and commitment to strategic attack was, for all intents and purposes, not even mentioned.[53] It is apparent from this that the War Department was still in control of Air Corps doctrine and producing material in which the airmen had little or no faith.

The outstanding men at ACTS had this first operational doctrine ready in time for war. Albeit flawed, in part because it promised more than airmen could deliver at the time, it was not beyond remedy when tested and found wanting in combat. Doctrine development was purely an ad hoc arrangement. No institutional process appeared. This has plagued Air Force doctrine writing for 70 years. The logical conclusion is that many in the Air Force didn't take doctrine seriously. The saving grace in 1941 was that the men who would lead the AAF in war believed absolutely in their doctrine, and they worked to implement it and finally to fix the faults as they appeared. ACTS had effectively transmitted the doctrine throughout the force before the war. The Air Corps officers, as we have seen, had become increasingly paranoid as a result of the War Department's treatment of them and their ideas. This doctrinal development sets out essentially all of the patterns that would be followed in succeeding years.

Doctrine Development in the Air Force, 1941-1955

The next doctrine development came during the North African campaign of 1942-43, when the AAF learned that in the tactical airpower arena it had gone to North Africa, to quote Gen Elwood R. ("Pete") Quesada, "with an abundance of ignorance!" [54] At Gen Dwight D. Eisenhower's direction, and with input from the Royal Air Force's (RAF) Air Vice-Marshal Arthur Coningham, AAF general Laurence S. Kuter and other senior airmen guided the development of FM 100-20, *Command and Employment of Air Power*, dated 21 July 1943. This publication, based on the experience of a single air campaign and written in the Army's field service regulations series of publications, would be the Air Force's basic doctrine manual through the Korean War. [55] This new manual was focused on the tactical air forces and on support of theater combat operations. What it did do, for the first time, was to establish in writing the priority order for the *major tactical air missions* of air superiority, interdiction, and close support.[56] To this day, the Air Force holds to these priorities in spite of the problems with making interdiction effective in most environments. FM 100-20 was another product of an ad hoc process and, as a result, failed to address the existing but unwritten strategic bombing doctrine beyond three short paragraphs on the subject. [57]

The most notable feature of this new manual to most Army officers was the firm announcement that *air and ground forces were coequal and interdependent*.[58] This was less a declaration of independence by the Air Force, as some have argued, [59] and more the announcement of the War Department's recognition of changed operational conditions imposed by the reality of war. It is also reflective of the only alternative to education as the transmission method for doctrine. This doctrine manual, addressing tactical air support for the Army while leaving strategic air doctrine unwritten for another decade, is suggestive of both the "split personality" of the Air Force and, perhaps more important, the fear of committing to more than it could realistically accomplish.

FM 100-20 got all of the attention as published doctrine, but it was the unofficial bombardment doctrine that earned the attention of the framers of *The United States Strategic Bombing Survey*. With the

A B-26 light bomber takes to the sky on another Operation Strangle mission against Communist targets in Korea as an antiaircraft crew watches. The entire doctrine effort after 1953 was influenced by the fact that airpower had not done very well in Korea in light of what it promised and could not deliver. Operation Strangle is the most notorious example of that failure.

war over, they asserted correctly, based on the evidence, that Allied airpower was decisive in the war in Western Europe.[60]

The mid-fifties were not one of those times in which innovative thinking in the Air Force was very highly prized. The strategic airmen still owned the Air Force, body and soul, and they knew what the answers were.

Separated from the Army on 18 September 1947, the old Army air arm at last "stood up" as the United States Air Force.[61] Also of importance to future doctrine writing efforts was the agreement by Eisenhower and Spaatz on a force structure that included the Tactical Air Command. This was an apparent reversal of earlier ideas that all combat airpower should be capable of both strategic and ground support missions.[62] It had to survive an immediate threat from the Navy, which attempted to get a piece of the strategic bombardment role for carrier aviation.[63] But survive it did, and FM 100-20 remained the Air Force's only doctrine manual until 1953, when the service awakened to the fact that things in Korea had not gone favorably for the brand-new Air Force.

The entire doctrine effort after 1953 was influenced by the fact that airpower had not done very well in Korea *in light of what it promised and could not deliver*. Operation Strangle is the most notorious example of that failure. Interdiction was a bedrock Air Force belief from the first publication of FM 100-20 in 1943. What basic doctrine could not do, and what there was no operational doctrine to do, was to articulate what could be accomplished with interdiction efforts and what circumstances were required in order to get what results. To this day, the Air Force remains essentially unwilling to reduce this to writing in the form of doctrine, in spite of evidence that it could do this very well indeed if it wished to do so.[64]

Nor had precision strategic bombing been able to make a very notable contribution to the ending of the Korean conflict either due to the absence of an appropriate strategic target set.[65] As a result of these failures in the Korean War, the Air Force seems to have concluded that published operational doctrine might do much to educate both its own officers as well as officers of other services.[66] The mid-fifties was not one of those times in which innovative thinking in the Air Force was very highly prized. The strategic airmen still owned the Air Force body and soul, and they knew what the answers were.

Even before the Air Force separated from the Army, it had formed Air University at Maxwell AFB, though some of its schools were at other bases.[67] Air University was to be the doctrine development and education organization for the service in the postwar world. Three categories of doctrine, category 1, 2, and 3 instructions—that is, basic, operational, and tactical doctrine—were to be developed and taught by the Air War College, Air Command and Staff School, and the Air Tactical School, respectively.[68] The doctrine was to be simpler than the Army's field manual system and

was to be modeled on the Navy's new doctrine series, which was called *United States Fleet (USF) Publications*.[69]

After extensive problems and numerous rewrites in the Air Staff, the first category 1 publication was pushed through the Air Force Council and emerged as AFM 1-2, *United States Air Force Basic Doctrine*, dated March 1953.[70] The chief, by then Gen Hoyt S. Vandenberg, expressed the view that

> basic air doctrine evolves from experience gained in war and from analysis of the continuing impact of new weapon systems on warfare. The dynamic and constant changes in new weapons makes periodic substantive review of this doctrine necessary.[71]

Maj Gen John DeForest Barker, deputy commander of Air University in 1953, understood the importance of the new service setting out its doctrine in writing. He said of the long, drawn-out, and frustrating exercise of writing AFM 1-2:

> I am disappointed with it . . . [the previous draft by AU presented] more clearly and more distinctly the why and wherefores of our doctrine . . . [and] It has taken the Air Force five tedious years to get an approved manual on basic air force doctrine . . . . [with essentially] no change of importance in the doctrine [over FM 100-20].[72]

This view contradicts Vandenberg's view of the relationship between basic doctrine and technology.

Barker opined that at the rate of progress of AFM 1-2, it would require 15 to 20 years to produce the proposed operational doctrine manuals. He pressed for approval for the Air University commander to publish Air Force manuals on operational doctrine. Gen Thomas D. White, speaking for the chief, assured Barker that reviews of operational manuals would be confined to substance, rather than the style and arrangement reviews which had plagued the development of AFM 1-2.[73]

On 12 March 1953, the same day that the chief of staff approved AFM 1-2, Air University forwarded four operational doctrine draft manuals to the Air Staff. Ultimately they were published on 1 September 1953 as AFM 1-3, *Theater Air Operations*; AFM 1-4, *Air Defense Operations*; and AFM 1-5, *Air Operations in Conjunction with Amphibious Operations*. After some discussion and changes in content, AFM 1-8, *Strategic Air Operations*, was published on 1 May 1954.[74] According to this manual, strategic air operations were designed to

> destroy or render ineffective the crucial portions of the enemy nation's structure—those elements within the enemy's homeland vital to its continued prosecution of the war. They also contribute directly and indirectly to gaining and maintaining control of the air.[75]

It sounded so much like the ACTS faculty of the 1930s that it might well have been written by them. It was the first formal doctrine on strategic air operations ever produced by the Air Force—and also the last!

Over the next two years, there were some revisions to the 1953 set of basic and operational doctrine manuals. AFM 1-2 continued to be the Air Force's basic doctrine publication, and all others were expected to follow its fundamental thought. It was revised in 1954 and again in 1955, with no significant changes in substance. Other operational doctrine manuals, such as AFM 1-9, *Theater Airlift Operations*, 1 July 1954, were published, and some were revised at least once. These seem to have been revised at Air University, but this is not absolutely clear.

AFM 1-3, *Theater Air Operations*, 1 April 1954, from which stemmed other operational doctrine manuals, established two arenas of aerial warfare. The first was "heartland" action, clearly the arena of strategic air operations, as covered in AFM 1-8. The second, "peripheral" action, was the purview of theater air forces and the real subject of AFM 1-3. This manual reflected growing concern with electronic warfare, a phenomenon already a decade old and long a matter dealt with by unwritten operational and tactical doctrine. But in most respects, this manual resembled FM 100-20 more than it differed from it. It considered theater operations, theater air operations, employment of theater air forces, and command and control matters.[76]

These new and revised doctrine manuals were clearly an attempt to be ready for conventional theater warfare such as Korea and to give some thought to the subject before the next war came along. Although the Air Force wrestled with the problems manifest in Korea, including the development of precision guided munitions,[77] new navigation systems, night operations, and the development of interdiction, none of these efforts gave very good results at first.[78] Chief among the reasons were technological shortcomings and an unwillingness to address the conditions under which interdiction could be effective.

The Air Force was already beginning to divorce airpower theory, which had been the driver before World War II, and was becoming focused upon the hardware as a salvation formula. The war with the admirals over the B-36 and the subsequent procurement of the B-52 solidified the notion that all was well if the

Air Force could do strategic attack. This struggle also reinforced the preexisting paranoia.[79] Technology, as evidenced by the treatment of nuclear weapons in AFM 1-8, was not driving the equation, in spite of Vandenberg's earlier remarks.

In summary, 1955 found the Air Force with basic doctrine that was little more than a derivative of FM 100-20. Written operational doctrine was brand new, and only in the strategic air operations arena did the advent of atomic weapons have much impact. And even there, the doctrine writers and the approving airpower operators were not very sure that nuclear weapons had changed air warfare all that much, aside from providing greater destructive power. The power of theory was still evident, if eroded, as was the unwillingness to commit to much in writing.

Air Force Doctrine, 1955-1978

The basic doctrine in AFM 1-2 was hardly changed over that of FM 100-20 of 1943. The context was the nuclear age. The developing single integrated operational plan (SIOP) from about 1960, nuclear strategy, the development of bigger and better nuclear weapons,[80] the rush towards the deployment of missile technology, and rapidly moving developments in the space arena[81] captured the Air Force's attention and moved it from airpower theory as the doctrine driver towards a budget-driven mentality.[82] Strategic deterrence had essentially become the raison d'être of the Air Force. This was reinforced by the paranoid mind-set driven by the recent separation struggle.

The original concept of Air University, as noted earlier, had been that doctrine would be written and taught at three levels: basic, operational, and tactical—the proposed categories 1, 2, and 3 publications. From about 1955, and for a decade thereafter, nothing more was done with this idea, nor did the Air Force pay much attention to its doctrinal house save to occasionally revise its basic doctrine, which remained AFM 1-2 for almost the whole decade.

On 15 July 1958, the Air Doctrine Branch was established within the new Air Policy Division of the Air Staff, with oversight of doctrine development.[83] However, basic doctrine was nominally still to be the responsibility of Air University for reasons of objectivity, while operational doctrine was now to be the responsibility of the major commands (MAJCOM).[84] So much for the stability and institutionalization of the process. From here on doctrine would be the stepchild of whoever had responsibility for it at the moment.

Nevertheless, the new Air Doctrine Branch asserted itself and usurped the process of writing basic doctrine from Air University by revising AFM 1-2 in December 1959. The introduction of the term *aerospace power* in lieu of *airpower* in the 1959 version of AFM 1-2, including the idea that "aerospace" as an operational medium was everything above the earth's surface, was a major step by the Air Force towards "capturing" the new arena of space as its legitimate operational realm.[85] It goes to the heart of the issue of how the medium in which the Air Force operates is unlike that of either of the other services. Its environment is quite literally limitless.

The advent of the Kennedy administration, with new ideas about warfare and strategy, brought great pressure for change to bear on all of the services.[86] The Army's decision to press Congress for fixed-wing aircraft, the traditional preserve of the Air Force in the postwar world, forced the Air Force to begin to rethink its overall position. Once again, the Air Force's paranoia was reinforced by another service trying to grab a piece of its action.[87] And internal criticism from a new set of innovative thinkers, men like Maj Gen Dale O. Smith, drove a revisitation of doctrinal thinking.[88]

On 15 April 1963, General Smith submitted a scathing indictment of Air Force operational doctrine that had been committed to the MAJCOMs five years before:

> The idea of letting our doctrine drift from the whim of one operational leader to another, or from one *ad hoc* measure to the next, will never provide us with the comprehensive, dynamic, understandable, and salable doctrine necessary to save the Air Force.[89]

The specific attack by Smith on the "whim of one operational leader to another" addresses the matter of operational doctrine clearly and unequivocally. The expression "to save the Air Force" is symptomatic of the continuation of the driving paranoia of the Air Force, even in the mid-sixties. The admission that the doctrine process was chaotic is reflective of the long-term problem created by the failure to effectively institutionalize its development and then to leave the process and the institution alone, except for fine-tuning.

In March 1963, with guidance from Air Force Secretary Eugene M. Zuckert,[90] Gen Curtis E. LeMay, chief of staff of the Air Force, set in motion the most far-reaching study and reconsideration of the Air Force that had been undertaken since the formulation of AWPD-1. This effort, headed by Gen Bernard Schriever of Air Force Systems Command, was identified as Project Forecast.[91] This was a thorough-going examination of the future of technology and its pos-

sible relationship to Air Force operations. The intention was to get out in front of technology and estimate where it might possibly go. Schriever ultimately summed up Forecast with the remark "that in a number of technical areas, such as materials, propulsion, flight dynamics, guidance, and computer technology, we identified many promising technological opportunities."[92]

Forecast laid the groundwork for the development of Air Force technology into the 1980s. It was the first of several major technology studies designed to keep the Air Force out in front of technology.

Even before Forecast was launched, however, Zuckert was already working to get the Air Force to change its conceptual approach to doctrine. He noted in late 1965 that the Air Force had far greater difficulty in adjusting to new ideas and new methods than it did to new hardware. Moreover, new ideas in the realms of strategy, concepts, and doctrine were very difficult to sell.[93] But sell them he did with the help of LeMay. Zuckert conceived the idea that Air Force doctrine must be written to support national policy and strategy, a different concept from a purely aerospace power doctrine based on airpower theory, rooted in operational experience, and reflective of the capabilities and limitations of aerospace forces in peace and in war.[94] Thus, politics accelerated the divorce of doctrine from airpower theory.

In August 1964, the first AFM 1-1, *United States Air Force Basic Doctrine*, appeared with a clearly stated source for its content. The new manual held that basic doctrine evolves through the continuing analysis and testing of military operations in the light of national objective and the changing military environment."[95]

In Zuckert's view, the Air Force was ready to divorce the old idea that airpower could win wars alone. He hoped that it was ready to see itself as part of the national military establishment in support of national policy objectives. This position, he argued, was buttressed by the notion that almost everyone now recognized that *wars could not be won without airpower!* [96]

The new manual introduced the idea of flexible response and suggested that total victory in even a conventional war might not be possible.[97] It further stated that while the Air Force was a deterrent force, it had to be prepared to fight general nuclear, tactical nuclear, conventional, and counterinsurgency forms of wars. It spelled out the need for both manned and unmanned systems for offensive and defensive wars, and, in this respect, expressly acknowledged the impact of technology on basic doctrine for the first time. It further identified the traditional missions of air superiority, interdiction, close air support, reconnaissance, and airlift in all but general nuclear war. It was the first and last Air Force basic doctrine manual to omit the principles of war.[98] Doctrine was no longer based upon airpower theory, and only to a rather limited extent upon experience.

In 1965, just as the US became heavily involved in Vietnam, the Air Force began the issue of a new set of operational doctrine manuals, for the first time numbered in the 2-series, consistent with the original Air University recommendation of 1946. The first and most important of these was AFM 2-1, *Tactical Air Operations—Counter Air, Close Air Support , and Air Interdiction,* dated 14 June 1965.

There is some evidence that there was confusion about the level, if not the function, of the 2-series of manuals. It is manifest in the opening remarks:

> This manual describes the basic doctrines and capabilities of tactical air power and sets forth fundamental principles for tactical air force operations in three of the five combat air functions.[99]

The preparers appear to have been confused about what type of doctrine this was and where it fit into air operations! It is reminiscent of Hansell's argument that the ACTS bombardment doctrine was "basic" doctrine. [100]

The opening went on to describe a set of manuals that would follow the publication of AFM 2-1: AFM 2-4, *Assault Airlift*; AFM 2-6, *Tactical Air Reconnaissance;* AFM 2-2, *Air Operations in Conjunction with Amphibious Operations*; AFM 2-3, *Employment of Nuclear Weapons* (Secret); AFM 2-5, *Special Air Warfare*; and AFM 2-7, *Tactical Air Control System* . It also said that AFM 2-1 expressly superseded AFM 1-3 (1 April 1954) and AFM 1-7 (1 March 1954). [101]

This revision of the operational doctrine manuals of the Air Force was destined to be the last overhaul of that level of doctrine Air Force-wide. It would be the operational doctrine with which the Air Force would fight the Vietnam conflict and with which it would have to live for more than a decade.

AFM 2-1 introduced in writing the idea of sortie apportionment, a harbinger of later concepts about the employment of tactical airpower. [102] It addressed interdiction in enough detail to give operators some idea about how to plan those efforts. [103] Naturally, it addressed air superiority, just as had FM 100-20 of 1943, and along similar lines. [104] By the arrangement of its chapters on specifics, counterair, interdiction, and close air support, it confirmed the long-established priorities on what theater air forces should accomplish and in what order. [105] It still reflected the Air Force's unwillingness to spell out what it could really do in war, a reflection of its now traditional fear of committing to

more in writing than it could really deliver.

AFM 1-1 was revised in minor ways in 1971 and again in 1975 by the Air Doctrine Branch of the Air Staff. Air University's failure to effectively teach doctrine, among other things, was evident in the Clements Commission Report of 1973.[106] This made it clear that transmission of doctrine into the force, at least by PME, was seriously deficient.

While the Air Force was revising its basic doctrine, it had foundered in its efforts to write joint doctrine for close air support. This effort, authorized by the Joint Chiefs of Staff (JCS) on 13 February 1967, led to five different drafts, after which the Air Force gave up the ghost because it could not get the services to agree on "joint doctrine."[107]

In 1978, in the wake of the experience of the Vietnam War, there appeared an entirely new operational doctrine manual, Tactical Air Command Manual (TACM) 2-1, *Aerospace Operational Doctrine: Tactical Air Operations*, dated 15 April 1978.[108] This was issued because the Air Force, after repeated attempts to revise AFM 2-1 of 1965, had quit in frustration. United States Air Forces Europe (USAFE) was the chief culprit in this fiasco, according to the officers who were around then and who still remember the problem. Since the Air Force could not get service-wide agreement on the contents of a new manual, it let Tactical Air Command issue a manual on which agreement did not have to be as broad as on an Air Force manual![109] The new manual identified AFM 2-series publications as sources for "procedural detail for specific tactical missions . . . with tactics in the appropriate 3-XX series manuals."[110] Doctrine writing, especially at the operational level, was still in disarray—after nearly 50 years of trying—largely due to lack of institutionalization.

TACM 2-1 talked about apportionment, allocation, and allotment[111] as functions of different levels of command that ended in the air tasking order (ATO).[112] It set in doctrine ideas that had been refined in Vietnam. Tactical air control centers (TACC), airlift control centers (ALCC), and airlift control elements (ALCE), among other techniques, were "written down."[113] The Air Force continued to struggle to fulfill its promises of support to the Army.

TACM 2-1 was to be the last 2-1 manual published by the Air Force. Although much of it is now quite dated, most of the terms, tactics, and techniques it sets out are still employed in the management of tactical air operations, including the idea that "tactical" and "strategic" are missions and not assets.[114] And since Air University had ceased to be the focus of doctrine, it did not do much teaching of doctrine either.[115]

In 1979 AFM 1-1 was revised, with only minor changes over the two previous editions of the seventies. Thus, at the end of the seventies, the Air Force was essentially using an AFM 1-1 that was at least partly faulty in conception, and one from which operational doctrine had not been developed beyond a single major command manual, not binding in any sense on the whole of the service. There was only a partially institutionalized process for the development of doctrine, at the basic level. Transmission of the doctrine to the force seems to have essentially disappeared.[116]

Operational doctrine was also in trouble because responsibility for writing it moved often; consequently, the personnel changed so fast and were so frequently new to the process, factors, and substance of doctrine that they—unlike the officers serving lengthy assignments at ACTS in the prewar period[117]—could hardly be expected to do the job well. As everyone today still remembers, the force, its doctrine, and its doctrine process were hollow—not to mention its education of the officer corps in what the service believed doctrinally.[118] And on this sad note the seventies ended.

The New Era in Doctrine: 1980-Present

With the issue of AFM 1-1, *Basic Aerospace Doctrine of the United States Air Force*, in 1984, a major effort to get back out in front of events occurred. The writing of basic doctrine was still lodged in the Air Staff. However, the lack of any meaningful continuity, historical knowledge and skill, or operational expertise above cockpit level remained serious problems in the absence of an intellectual environment such as that of ACTS. The principles of war, long since returned to the doctrine manual, were rewritten in a unique way that departed from the traditional nine to an historically unfounded set of 12.[119] The manual itself was a lengthy, rambling narrative. It departed from tradition and drew lengthy criticism over the next few years. It was, however, an improvement over the basic doctrine manuals that had gone immediately before it.

In the late 1980s the Air Force, in yet another attempt to get fully out in front of policy, strategy, and technology, launched the Todd Commission to look at the Air Force in space. Although most of that study is still classified, it targeted space as a place in which doctrine could and should apply.[120]

The Gulf War brought to the fore the technology, tactics, techniques, and operational methods on which the Air Force had been working since the Vietnam War. Precision guided munitions, precision navigation systems like the global positioning system (GPS), and day-night all-weather operations allowed the Air Force to fly, fight, and win in the face of the worst weather in

The Gulf War brought to the fore the technology, tactics, techniques, and operational methods on which the Air Force had been working since the Vietnam War. Technology helped to win the fastest, lowest casualty, most devastatingly destructive one-sided war in recorded history. Air Force capabilities had come of age.

the Middle East in more than a decade. [121] That technology helped to win the fastest, lowest casualty, most devastatingly destructive one-sided war in recorded history. Air Force capabilities had come of age.

In the wake of the Todd Commission, and while the Gulf War was materializing and being fought, a new basic doctrine writing effort was commissioned by the Air Force chief of staff. Since the chief was historical-minded, and perhaps had the intent of revitalizing ACTS, he removed this new doctrine-writing effort from the Air Staff. The new effort of 1989 was placed at Air University one more time.

However, the Air Staff, in a fit of distemper, started a revision of the 1984 manual at the same time that Air University's Center for Aerospace Doctrine, Research, and Education (CADRE) was undertaking this monumental new writing effort, at the direction of the chief, to produce a fundamentally different type of basic doctrine manual. Fortunately, this duplication of effort was soon terminated, and the task remained with CADRE, in a group that had both historical knowledge and operational experience among its members.

The new AFM 1-1, *Basic Aerospace Doctrine of the United States Air Force*, March 1992, attempted to incorporate space in Air Force basic doctrine. [122] Volume 1 of this new doctrine manual contains a concise statement of basic doctrine. The much longer second volume is a set of essays tied to the doctrinal statements in volume 1, providing factual support for the Air Force's basic doctrine. It is experience-based, systematic, logically organized, and it encompasses all of the principal concerns of Air Force doctrine, including organizing, training, equipping, and educating the force.[123] General officers of the operational Air Force had a major voice in finalizing the document. [124]

One of the interesting aspects of this manual is the inclusion of matters clearly in the traditional category of "operational-level" doctrine. For example, the discussions of the tenets of aerospace power or airmindedness speak strongly to operational-level concerns. It appears that there was no hesitation in doing this—not because the differences weren't understood, but rather because it was not felt that operational doctrine would be forthcoming any time in the near future. After all, the Air Force has not had a published operational doctrine manual since 1965, aside from selected support fields like logistics.

As this is written, yet another research effort has been completed at Air University—to get out in front

of technology and policy with SPACECAST 2020. [125] The intent is to give as much creative and innovative thought as possible to the future of space and space technology, and, like the first Forecast [126] effort of the early sixties, to get the Air Force back out in front across the board. In the forthcoming year, AIR FORCE 2025 will undertake to do the same thing for the whole spectrum of Air Force activity.

However, what is of even greater significance is the recent change in doctrine writing by the Air Force. The Air Force Doctrine Center stood up at Langley Air Force Base recently with a mandate to produce an entire set of doctrine publications set apart from all other Air Force publications. In the new policy directive on doctrine, Air University, for the first time since 1946, is charged with educating the entire Air Force in matters of doctrine. Among other things, operational doctrine is included in the new pubs to be produced!

The schedule for the production of an entire set of operational doctrine manuals is very short indeed. The problems that we have been looking at over nearly 70 years have still not been addressed, nor have some of the corollary problems. In each of the cases when the Air Force has published operational doctrine, the chief has apparently been instrumental. Arnold ensured the publishing of the ACTS doctrine in 1941 under the guise of AWPD-1 partly by whom he selected to write it. In the mid-1950s, Vandenberg ensured the timely publishing of the post-Korean War manuals. In the mid-1960s, LeMay saw to the publishing of operational doctrine before he left the chief's job. In the next few years, if the Doctrine Center is to have success in publishing operational doctrine, it will require the intervention of a strong and determined chief.

Still vexing is the fact that the doctrine process is not yet institutionalized. It has been moved one more time. The writing of basic doctrine is in its fourth location, and operational doctrine is in its fifth or sixth location. The Air Force is still plagued by a high degree of paranoia about its survival as a service in spite of its track record of success. [127] The Air Force is writing doctrine once again with no evidence that it is going to be rooted in any theory of aerospace power. If the new battery of doctrine writers is as chary about committing to writing what the Air Force believes it can deliver to other forces on the battlefield, the service will be trapped in the same deadly closed loop that has plagued it for 70 years. Only time will determine how well these problems will be identified and dealt with.

Conclusion

There are individuals today who are talking about the need for the Air Force to reexamine its theoretical base and to develop new airpower theories for the present and future. Airpower theory will not serve the modern Air Force's future. *The Air Force is an aerospace force, and its future is now in space as certainly as it was in the air in 1926.*

What the Air Force must work towards is a first-generation theory of the integrated employment of aerospace assets for war fighting. Airplanes will not go away in the foreseeable future, but the required aerospace theory must be futuristic, not retrospective. The focus should not be on the current assets, but rather on the future theory. That theory must look far into the future, a future of war fighting in and from space. Nor should the Air Force think in terms other than the need to send military men into space, for we cannot see the future, and the theory must provide for unforeseeable contingencies. Men are as essential in space as they are within the atmospheric envelope. It won't be low-cost, but in terms of today's world and economy such requirements are no more unreachable than what Douhet was theorizing about when he saw airpower as a war-winning concept in 1922. The systems about which he theorized were feasible but were, as events demonstrated, more than 20 years in the future. The theory we require should be of the same type, a theory that evidence suggests can be carried out in the future, but one which is out in front of current capabilities.

What the Air Force needs now, above all else, is creative thinkers to work on a true aerospace theory upon which its future concept of warfare can be based. SPACECAST 2020 and the newer AIR FORCE 2025, if they are effectively pursued hereafter with proper intellectual integrity, might be a starting point for such a theory of aerospace power. In the interim, however, the Air Force may have to rely on a complete rethink of its theoretical underpinnings until new, forward-looking theories can be developed. It must, at least temporarily, reground itself in theoretical concepts of war winning through aerospace power. As Arnold pointed out much earlier, and as the high-altitude daylight strategic bombing doctrine developed in the interwar years shows, essentially sound doctrine can in fact be developed from a forward-looking theory. In time it must be tested in combat and revised appropriately if it is not found to be wholly sound.

The Air Force is an aerospace force, and its future is now in space as certainly as it was in the air in 1926.

As we have seen, the Air Force has been unable to institutionalize its doctrine-writing program in the manner of the Army. If the Air Force is able to institu-

tionalize its doctrine-writing process at Langley with its new Doctrine Center and give the staff support, education, and longevity in the job and leave it alone for the next half century instead of moving the function every few years, it may get what it is paying for and desperately needs—sound and realistic operational doctrine to serve into the future of air-breathing air forces. And it may be creative enough to work the aerospace theory and future doctrine issues as well. But it will require a cerebral atmosphere, one not routinely turned upside down. The Air Force must give up its predilection to "ad hoc" its doctrine, and it must commit cerebral personnel on a long-term basis to the preparation of doctrine, particularly operational doctrine so that it can talk to the Army and Navy at appropriate levels of endeavor.

In addition to institutionalizing the process, the Air Force must ensure that whatever doctrine it has is effectively transmitted into, and understood by, the officer corps that must fight with it. It should be taught routinely, effectively, thoroughly, and with hands-on, get-your-hands-dirty exercises to thoroughly familiarize everyone with the application of the doctrine in all possible situations from the cockpit to the JFACC level as determined by the officer's rank and experience. Every PME institution should be required to instruct its officer corps in such a manner.

In the immediate future, the Air Force must write operational doctrine that is accepted service-wide. The Air Force does not need another TACM 2-1 experience in which the service itself cannot agree on how it is to do its mission. In an increasingly joint world, the Air Force must commit with clarity and without equivocation to what it can do for the theater commander, the ground component commander, and the naval component commander, how effectively it believes it can do those things to which it does commit, and what factors will limit or impair its ability to live up to those commitments. That is what operational doctrine should be about. It isn't easy, but it is almost certainly necessary at this point in time. And the Air Force can do it, and do it well, even as it works on new theories of aerospace power.

Central to doing these things is the elimination of the paranoia which still plagues the Air Force. *No country can win a war, or even stay on the modern battlefield, without its airpower in control of the skies overhead.*[128] Paranoia is simply wrong in this day and age, but it is rampant in the officer corps today, and at all levels. This is in part because we don't do a very effective job at any PME level of educating the officer corps about the modern realities of aerospace power. The service must work at putting the paranoia behind it. It is rooted in history that is no longer relevant. The Air Force must expend its energy on thinking about its theoretical and doctrinal underpinnings and its future as the dominant aerospace force—on the battlefield and in space.

> *In 50 years, space will be the core of the USAF—like SAC in the 50s and 60s.*
>
> —Gen Charles A. Horner, USCINCSPACE

Notes

1. For the sake of simplicity, the modern title is used throughout as a generic term for the Air Service, the Army Air Corps, and the Army Air Forces. The Air Force's titles historically were: the Aeronautical Division of the Signal Corps, 1 August 1916 to 21 May 1918; the Air Service, 21 May 1918 to 2 July 1926; the Army Air Corps, 2 July 1926 to 18 September 1947; the Army Air Forces coexisted with the Air Corps, which was the branch to which personnel were assigned, as a component of the US Army from 20 June 1941 to 18 September 1947; and since that date the service has been the United States Air Force.

2. Carl H. Builder, *The Icarus Syndrome: The Role of Air Power Theory in the Evolution and Fate of the U.S. Air Force* (New Brunswick, N.J.: Transaction Publishers, 1994), xvii.

3. Ibid., 76-79. Builder convincingly demonstrates this to be the case in the development of the high-altitude, daylight, precision, strategic bombing doctrine at the Air Corps Tactical School in the early thirties. It is a consistent and well-proven argument by the end of the book that airpower theory is the source of sound doctrine, coupled as LeMay noted, with experience.

4. The Air Force lost $46 billion in the late 1980s, while the other two service departments lost only about $22 billion each! Ibid., 8.

5. Robert Frank Futrell, *Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force,* vol. 1, *1907-1960* (Maxwell AFB, Ala.: Air University Press, 1989), 95.

6. Air Force Manual (AFM) 1-1, *Basic Aerospace Doctrine of the United States Air Force,* March 1992, vol. 2, 274.

7. Air Force Pamphlet (AFP) 5-1-1, *Joint Chiefs of Staff Dictionary,* 1948, 62. See also Woodford Agee Heflin, ed., *The United States Air Force Dictionary* (Maxwell AFB, Ala.: Air University Press, 1956), 359.

8. The USAF introduced the operational level of war to the American military community in 1976 when its Russian translation program produced Vasiliy Ye. Savkin, *The Basic Principles of Operational Art and Tactics* (Washington, D.C.: Government Printing Office, 1976). On page 119 one finds an early mention of the "conduct of battle, an operation, or a war as a whole." The whole book looks at the operational level of war, as indicated by its title. The Army appears to have picked up on this and by 1982 had introduced the concept in its FM 100-5 (see note 9).

9. For which see the section titled "Doctrine Development in the Air Force, 1941-1955." There is a prevailing notion that the US Army first introduced the idea of opera-

tional doctrine to the American military community. In fact, a review of FM 100-5, *Operations*, change 1, 1 July 1976, states that "this manual sets forth the basic concepts of US Army doctrine," i. Its successor, dated 20 August 1982, states that it "describes US Army operational doctrine." i. This appears to be one of the first official uses of this term by the Army.

10. AFM 1-1, *Basic Aerospace Doctrine of the United States Air Force,* March1992, vol. 2, 296. The definition from the *USAF Dictionary* of 1956 for "operational air doctrine" is simply "doctrine on how to use air power in particular operations."

11. Mitchell gave a speech to the Army War College on 22 November 1922 during which he discussed an impending doctrine publication that never materialized. The ultimate product was TR 440-15 of 1926 four years later.

12. Futrell, *Ideas*, vol. 1, 50.

13. Alfred F. Hurley, *Billy Mitchell: Crusader for Air Power* (Bloomington, Ind.: Indiana University Press, 1975), 112.

14. The Air Corps Tactical School (ACTS) was founded at Langley Field on 25 February 1920 as the Field Officers Course of the Air Service School and soon thereafter became the Air Service Field Officers School. In November 1922, it was redesignated the Air Service Tactical School (ASTS), and on the passage of the Air Corps Act of 1926 became the Air Corps Tactical School. Robert T. Finney, *History of the Air Corps Tactical School, 1920-1940,* USAF Historical Study 100 (Maxwell AFB, Ala.: 1955), 6-7. Please note that a 1992 Air Force Historical Research Agency reprint of this work is much more widely available than the 1955 version, and is paginated very differently. For ease of reference, I will include the new edition's pages in brackets [9-12] for pages 6-7 in this case.

15. DeWitt S. Copp, *A Few Great Captains: The Men and Events That Shaped the Development of U.S. Air Power* (Garden City, N.Y.: Doubleday and Company, 1980), xiv-xix, gives an overview introduction to the problem, and the balance of the book is devoted to this long and complex tale. The events that created the Air Force's paranoia are self-evident and examined at some length, as are the divisions within the Air Corps itself.

16. Giulio Douhet, *The Command of the Air*, trans. Dino Ferrari (1942; reprint, Washington, D.C.: Office of Air Force History, 1983). Douhet's idea of strategic attack involved massed bombers striking cities and the associated industrial, communications, and governmental apparatus with high explosives, incendiaries, and chemicals.

17. Futrell, *Ideas,* vol. 1, 39, identifies a typescript translation of Douhet stamped "received" at the Field Officers School (ACTS predecessor) dated 23 May 1923. Futrell correctly makes the point that Douhet's ideas at the time were politically unacceptable in this country; that cannot, however, be construed to mean that Douhet had no influence. We just don't know for certain.

18. The author held many long conversations with Haywood S. Hansell, Jr., over the years of his visits to the Air War College from 1984 to 1988 about the curriculum, ideas, and personnel at the Air Corps Tactical School from 1934, when he was a student, to 1938 (hereafter cited as Hansell interviews); Finney, 59-61 [106-9], 73 [124]. Larry Kuter, in an interview in 1974 noted that he first heard of Douhet when he was a student at ACTS in 1934-35. Gen Laurence S. Kuter, USAF, Retired, interview by Hugh N. Ahmann and Tom Sturm, 30 September-3 October 1974, *USAF Oral History Interview K239.0512-810*, appendix, 118, USAF Historical Research Agency, Maxwell AFB, Alabama.

19. Hurley makes it clear that during his 1921-22 trip to Europe, Mitchell had "frequent conversations" with Giulio Douhet. Hurley, 75.

20. My best source for this is the Hansell interviews reinforced by Builder, 53-54; and Hurley, 128. Futrell's discussion of the Federal Aviation Commission hearings on its creation in 1934 hints at how close Mitchell and the men of the faculty at ACTS were, in spite of their restraint at those hearings. Futrell, *Ideas,* vol. 1, 71-72.

21. Futrell, *Ideas,* vol. 1, 69, notes that George Kenney's translation of Douhet was used at ACTS from about 1933.

22. Finney, 12 [20], discusses briefly the "prejudice" of the other combatant branches against the Air Service in the mid-twenties. For the reasons behind the ground officers' viewing the airmen as radical, see 34-36 [69-73].

23. Copp, 36-51, identifies the disciples of Mitchell who dominated the Air Corps through World War II.

24. Lt Gen Ira C. Eaker, USAF, Retired, interview by Hugh N. Ahmann, 10-12 February 1975, *USAF Oral History Interview K239.0512-829*, 102-3, USAF Historical Research Agency, Maxwell AFB, Alabama. General Eaker makes it clear that the ACTS faculty were not the mainstream Air Force officer corps and that their views were very different indeed.

25. Builder, 46-47.

26. *The Functions of Air Power in Our National Strategy*, 25 September 1935, 9, Air Force Course, 1935-1936, instructors' file, Air Corps Tactical School, Maxwell Field, Alabama.

27. Kuter interview, appendix, 107, reflects this clearly; the Mitchell Trial was the onset of the paranoid mind-set of the Air Corps. In 1926, Hap Arnold was exiled to Fort Riley, Kansas, by Maj Gen Mason Patrick, chief of the Air Service, for leaking anti-Navy and anti-War Department information to the press, a move forced on Patrick by Secretary of War D. F. Davis. Thomas M. Coffey, *Hap*: *The Story of the U.S. Air Force and the Man Who Built It, General Henry H. ("Hap") Arnold* (New York: Viking Press, 1982), 125-28. Andrews fought so hard for the B-17 that the War Department tried to bribe him with the chief of Air Corps job when Gen O. M. Westover was killed, and he refused to give up on the B-17, so Arnold got the job instead. Copp, "Frank M. Andrews: Marshall's Airman," 59, in John L. Frisbee, ed., *Makers of the United States Air Force* (Washington, D.C.: Office of Air Force History, 1987). These types of events are the source roots of the paranoia.

28. Futrell, *Ideas,* vol. 1, 64-65.

29. Builder, 46-47.

30. Futrell, *Ideas,* vol. 1, 64-5. Walker became so associated with the idea that his students always attributed it

to him.

31. Finney, 22-23 [38-41] and 56-62 [102-12].

32. Hansell interviews.

33. Finney, 18-20 [32-33] discusses the presence of the 23d Composite Group at Maxwell Field in support of ACTS, but not the details of what it practiced.

34. Maj Gen Donald Wilson, USAF, Retired, interview by Hugh N. Ahmann, 10-11 December 1975**,** *USAF Oral History Interview K235.0512-878*, USAF Historical Research Agency, Maxwell AFB, Alabama, 30-33, says that the teaching of the strategic theory (of high-altitude, daylight, precision bombardment) was inaugurated with the class of 1933-1934, and Wilson was the premier architect of the course. (In the interview, Wilson remembered that the Air Corps had a few B-17s. However, the specifications were only issued in 1934 and the prototype only flew for the first time on 28 July 1935.) *The course and the doctrine were ahead of the technology*.

35. Benjamin S. Kelsey, *The Dragon's Teeth? The Creation of United States Air Power for World War II* (Washington, D.C.: Smithsonian Institution Press, 1982), 42-45. The whole book is an excellent study of interwar development and production problems.

36. Haywood S. Hansell, Jr., "Harold L. George: Apostle of Air Power," in Frisbee, (hereinafter cited as Hansell, *Makers*); Hansell interviews.

37. Thomas H. Greer, *The Development of Doctrine in the Army Air Arm, 1917-1941* (1955: reprint, Washington, D.C.: Office of Air Force History, 1985), 53. This was a position statement of 1935, as is reflected further in the Air Force course that year in a faculty-prepared text, probably of a lecture given on 25 September 1935, "The Functions of Air Power in Our National Strategy," stating that the first priority of air operations in the strategical offensive were operations against the national structure (of the enemy nation). Note the reference in 1935 to "when its equipment permits. . . ."

38. Finney, 33-34 [67-68]; Kuter interview, 175-76; Hurley, 128.

39. Futrell, *Ideas*, vol. 1, 39.

40. Finney, 34 [69-70].

41. Wilson expressly uses the term *industrial fabric*, Wilson interview, *33*; Haywood S. Hansell, Jr., *The Air Plan That Defeated Hitler* (Atlanta, Ga.: Higgins-McArthur/ Longino-Porter, 1972), 30-48. Targeting is discussed at some length, especially on pages 47-48. Hereinafter cited as Hansell, *Air Plan*.

42. Maurer Maurer, *Aviation in the U. S. Army, 1919-1939* (Washington, D.C.: Office of Air Force History, 1987), 388.

43. Ibid., 388-89. It was 1938 or 1939 before the ACTS faculty members even knew that a much improved bombsight was in development, and even then they were given neither details nor access to the sight itself, for which see Kuter interview, 133-35.

44. Hansell, *Makers*, 80-81.

45. Maurer, 392-93, provides some discussion of this matter.

46. Futrell, *Ideas*, vol. 1, 180, quotes Arnold on this relationship of doctrine ahead of equipment. Builder, 83-87, discusses how the doctrine preceded the development of the technology, the classic example of the correct relationship between doctrine and technology.

47. Futrell, *Ideas*, vol. 1, 180.

48. Builder, 34-37.

49. Eaker Interview, 96-106, discusses the ACTS curriculum and methods of instruction; Kuter interview, 143-45, notes that target studies, including details of target folder preparations, were taught along the lines used in the war.

50. Hansell, *Air Plan*, 30. Hansell called this doctrine basic simply because it was central to the concept of war winning through airpower, and in that sense it is used differently than it is today.

51. Futrell, *Ideas*, vol. 1, 95.

52. Ibid.

53. FM 1-5, *Air Corps Field Manual: Employment of the Aviation of the Army*, 15 April 1940, 9-13, speaks to "basic doctrine" and "air operations beyond the sphere of action of surface forces" with no real mention of strategic attack except in two whole sentences in par. 14b!

54. Lt Gen Elwood R. ("Pete") Quesada, USAF, Retired, was interviewed by Lt Col Roger Carter in 1987. A recorded videotape of the interview is available at the Air War College.

55. Futrell, *Ideas*, vol. 1, 137, lists the drafters of the manual in Washington, D.C., namely Col Morton H. McKinnon, Col Ralph F. Stearley, and Lt Col Orin H. Moore. The latter was from Headquarters AAF, which establishes the direct North African theater connection.

56. FM 100-20, *Command and Employment of Air Power*, 21 July 1943, 10-12.

57. Ibid., 8-9.

58. Ibid., 1.

59. Richard P. Hallion, *Strike From the Sky: The History of Battlefield Air Attack, 1911-1945* (Washington, D.C.: Smithsonian Institution Press, 1989), 173, argues that the use of all capital letters was a "hysterical" approach; that is hardly the case. When in the middle of a great war you decide to make a fundamental change in your doctrine and to communicate it worldwide, you must do something to get everyone focused on the salient changes.

60. *The United States Strategic Bombing Surveys (European War)(Pacific War)* (1945: reprint, Maxwell AFB, Ala.: Air University Press, 1987), 37.

61. It is worthy of note that Spaatz and Eisenhower had conversations about whether or not the new Air Force would support the Army, and Spaatz created Tactical Air Command as a definitive answer, even though he claimed Ike did not pressure him to do so! Futrell, *Ideas*, vol. 1, 206-8.

62. Ibid., 207.

63. Ibid., 191. For a contemporary view of the issue, see Cy Caldwell's "A Military Commentary: The Navy's Role in Strategic Bombing," *American Aviation* 17, no. 11 (26 October 1953): 54, 56.

64. This will be the subject of a forthcoming doctrine article by the author.

65. It is not widely realized that the "air pressure" campaign in the spring of 1953, which returned the Communists

to the talks, was conducted by tactical airpower in the form of F-84Gs breaking the dams north of Pyongyang.

66. Futrell, *Ideas,* vol. 1, 349-51, discusses this period.

67. History, Air University, 29 November 1945-30 June 1947, vol. 1, 10; and Maj Gen David M. Schlatter, "Air University," *Air Force Magazine*, July 1946, 9-11.

68. Futrell, *Ideas*, vol. 1, 369.

69. Air War College, *Special Study 2*, 19 December 1947; and letter, Air University to Chief of Staff, USAF, subject: Air Force System of Publications, 5 February 1948.

70. Futrell, *Ideas,* vol. 1, 393; and AFM 1-2.

71. Futrell, *Ideas*, vol. 1, 393.

72. Ibid. Futrell discusses in detail the problems with the writing of this first doctrine after the creation of the separate Air Force.

73. Ibid., 393-94.

74. AFM 1-8, *Strategic Air Operations*, 1 May 1954.

75. Ibid., 1.

76. AFM 1-3, *Theater Air Operations*, 1 April 1954, iv.

77. Roger A. Beaumont, "Rapiers versus Clubs: The Fitful History of 'Smart Bombs'," *Journal of the Royal United Services Institute* 126 (September 1981): 45-50.

78. Robert Frank Futrell, *The United States Air Force in Korea, 1950-1953*, rev. ed. (Washington, D.C.: Office of Air Force History, 1983), 408-10, 135-36, 325-31, and 700-704. Hereinafter cited as Futrell, *Korea*.

79. For the continuation of this problem, see Futrell, *Ideas*, vol. 1, 197, 199, 220, and the "revolt of the admirals," 258.

80. Futrell, *Ideas*, vol. 1, 618-29, discusses the minimum deterrence versus counterforce issues on the table at the time; vol. 2, 1961-1984, 87-98, discusses the driving nuclear strategy issues.

81. Futrell, *Ideas*, vol. 1, 477-637, deals with missile technology and the impact of missiles and space. The Air Force's preoccupation with technology is obvious in the quote from LeMay: "When something faster comes along I want it," ibid., vol. 2, 95.

82. Ibid., vol. 2, 230-31, demonstrates the extent to which the Kennedy administration drove this faulty line of doctrinal thinking.

83. Ibid., vol. 1, 10. This was a direct result, apparently, of the 1958 Defense Reorganization Act, which strengthened the role and influence of the Joint Chiefs in defense matters.

84. Ibid., vol. 2, 162-63.

85. AFM 1-2, *United States Air Force Basic Doctrine*, 1 December 1959, passim.

86. Futrell, *Ideas*, vol. 2, 171-96, gives an outstanding discussion of this period.

87. Ibid., 186-90, discusses LeMay's reaction to the Army's quest for fixed-wing aircraft.

88. Ibid., 172. In 1955, Smith, then a brigadier general in the USAF, had written a book entitled *U.S. Military Doctrine: A Study and Appraisal* (New York: Duell, Sloan & Pearce, Inc., 1955). By 1956 it was in its fifth printing, with sales perhaps helped by the fact that in the foreword, Gen Carl A. Spaatz, USAF, Retired, states, "The study of military doctrine and policy has been largely neglected in America."

89. Quoted in *Board of Visitors to Air University*, "Report of the Nineteenth Meeting," 19 April 1963, 7.

90. Futrell, *Ideas*, vol. 2, 228-35.

91. Ibid., 228.

92. Gen Bernard A. Schriever, "Forecast," *Air University Review* 16, no. 3 (March-April 1965): 3.

93. Eugene M. Zuckert, "Some Reflections on the Military Profession," *Air University Review* 17, no. 1 (November-December 1965): 5-6.

94. Futrell, *Ideas*, vol. 2, 230-31. Futrell's discussion of this approach is crucial to any understanding of Air Force thinking about basic doctrine after this point in time.

95. AFM 1-1, *United States Air Force Basic Doctrine*, August 1964, i.

96. Zuckert, 4.

97. It is interesting to reflect on the degree of change in Air Force thinking that this represents, since the original airpower theory had supported the idea that airpower could help avoid another bloody, protracted war like that of 1914-1918.

98. AFM 1-1, August 1964, passim.

99. AFM 2-1, *Tactical Air Operations—Counter Air, Close Air Support, and Air Interdiction*, 14 June 1965, i.

100. Hansell, *Air Plan*, 30.

101. AFM 2-1, 14 June 1965, i.

102. Ibid., 17; see for example the discussion below of the contents of TACM 2-1.

103. Ibid., 15-16.

104. Ibid., 9-14.

105. Ibid., 13, 15, and 17.

106. The Clements Commission was an objective attempt to reform PME DOD-wide in light of Vietnam and to head off an inane attempt to consolidate PME institutions.

107. Futrell, *Ideas*, vol. 2, 531-32.

108. Tactical Air Command Manual (TACM)2-1, *Aerospace Operational Doctrine: Tactical Air Operations*, 15 April 1978.

109. This was the view held by many members of the Air Force, but I have not been able to document it as fact at this point.

110. TACM 2-1, i.

111. *Apportionment* is the specifying of percentages of available airpower to selected tasks, such as air superiority, interdiction, close air support, and so on; *allocation* is the specifying of the number of sorties, individual flights by one aircraft, to each task consistent with the apportionment; *allotment* is the change of assignment of aircraft to a commander to carry out the missions.

112. Ibid., 3-4.

113. Ibid., 3-11.

114. Ibid., 1-2.

115. In 1973 the Clements Commission would comment on this and try to turn it around.

116. Although in the last few years some improvement has been made, the knowledge of an officer coming to any level of Air Force professional military education program (school) indicates how little they have had in their previous

educational exposure. We are simply not doing enough soon enough in an officer's career to make him an effective representative of his service's views of war fighting.

117. Finney, 53-65 [99-114], gives the complete faculty lists for the whole history of the school. That there was some real continuity is immediately apparent when these lists are examined.

118. James A. Winnefeld, Preston Niblack, and Dana J. Johnson, *A League of Airmen: U.S. Air Power in the Gulf War* (Santa Monica, Calif.: RAND , 1994), 8-11, discusses those years of the hollow force through which the Air Force had suffered.

119. The 12 that appeared there were the traditional nine plus three new ones: Timing and Tempo, Logistics, and Cohesion. AFM 1-1, 1984, 2-8 and 2-9.

120. Gen Larry Welch, then chief of staff, directed Maj Gen Harold Todd, commandant of the Air War College, to chair a commission to examine the Air Force in space. This was done at the secret and top secret levels, hence the reports are not available. However, the author was on the faculty of Air War College and remembers the commission very well indeed.

121. Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey: Summary Report* (Washington, D.C.: Department of the Air Force, 1993), 172-73.

122. AFM 1-1, March 1992, vol. 1, especially chapter 3.

123. Ibid., passim.

124. Maj Gen Charles Link, then commandant of Air War College, later commander of Third Air Force, and now on the European Command staff, was heavily involved in the final drafting of the work. Generals Charles G. Boyd, AU commander, and Merrill A. McPeak, chief of staff, handled the final coordination, touch-ups, final rewrites, and the task of getting the manual promulgated. It took a strong chief to get this manual adopted in a timely manner.

125. This forecast effort was launched at the express instruction of General McPeak, the chief of staff of the Air Force.

126. It is worth noting that the Air Force has commissioned several "forecasts" over the years. I have mentioned only the one or two of particular note from a doctrinal point of view; Futrell, *Ideas*, vols. 1 and 2, passim.

127. The author has been on the faculty of Air War College for 10 years, with ample opportunity to teach and talk with Air Command and Staff College students as well. This paranoia, albeit a fact of life for Air Force officers, is something very few will admit to publicly but will freely discuss privately. They admit that it is conveyed from one generation of officers to the next, almost as though it were the sacred legacy of the service.

128. Guerrilla wars may be an exception to this, but airpower in a variety of forms is indispensable for counterinsurgency forces.

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